CHARGING INFRASTRUCTURE FOR ELECTRIC BUSES

Jakarta, 7 Juli 2021

PT PLN (Persero)
WHAT IS THE ISSUES?

The phenomenon of big cities that are noisy and the air is polluted due to motorized vehicles, electric vehicles are one of the best choices.

The electric bus is the latest transportation system with the advantages of convenience, reliability, safety, environmental aspects, and public acceptance.

The main components of the electric bus public transportation system are Buses, Charging Stations and Supporting.

The implementation of electric buses requires synergy and a common vision between the Government, bus operators, the vehicle and charging system provider industry, and PLN as the electricity provider.
The system is said to be “Normal” if the power reserve is more than 30%.

The system is said to be “Siaga” if the power reserve is less than 30%.

The system is said to be in “Defisit” if at the time of the highest peak load, capable power is less than peak load.

Information:
*) Units in MW
*) Only 20 Big Systems
*) DMN is Net Capability
*) BP is Peak Load
*) CAD is Reserves in MW and percent

The average reserve margin for the whole system is 52%. In the Java-Bali system, the reserve margin reaches 50% (sales contribution reaches 70%).

Based on Net Capability at Highest Peak Load January 2021
PLN’S SUPPORT IN EV ECOSYSTEM

PLN has developed EV ecosystem by inviting 20 stakeholders which have big role in EV ecosystem under the MoU.

Home Charging Usage
1. PLN provides discount price for EV user to charge the EV in low peak hours (22.00 – 04.00)
2. Free Upgrade Customer Segment

PLN provides electricity for EV demand through the development of 35 GW Program.
**ELECTRIC VEHICLE CHARGING STATION (EVCS) INFRASTRUCTURE DEVELOPMENT STATUS IN INDONESIA & ESTIMATED DEMAND GROWTH OF EVCS TO 2031**

Based on who built it:
- PLN = 34 EVCS Point *)
- Non PLN (other parties) = 65 EVCS Point**

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**KEY POINTS**

- Estimation of EVCS point needed per year with ratio 10 EV : 1 EVCS
- Estimation also take into account the Fast Charging and Medium Charging Level
- The estimation include the national requirement that provided by PLN or other Parties
- For those interested in building EVCS, PLN has prepared a stimulus and several business schemes

*) Updated May 2021
**) based on existing data at PLN, the number in the field could be more
Stimulus for owners of PRIVATE ELECTRICITY INSTALLATIONS AND EVCS BUSINESS ENTITIES

Minister of Energy and Mineral Resources Regulation No. 13 Year 2020

- Determination of Bulk Tariff with a factor of $Q = 1.01$ or equivalent to Rp. 714/kWh for Owners of Private Electricity Installations for Public Transportation, EVCS Business Entities, and EVBCS Business Entities.

- Determination of the N multiplier of 1.5 or equivalent to Rp. 2,466/kWh for EV owners who charge at PLN's EVCS.

- Exemption of minimum account for the first 2 (two) years for Private Electricity Installation Owners for Public Transportation, EVCS Business Entities, and EVBCS Business Entities.

- Reduction in the cost of connecting additional power or new installations for Private Electrical Installation Owners, Sales IUPTL Holders, and EVCS / EVBCS Business Entities.

- Remission of electricity subscription guarantee for Private Electrical Installation Owners, Sales IUPTL Holders, and EVCS / EVBCS Business Entities.
**EVCS BUSINESS SCHEME**

**BUSINESS SCHEME 1:**
PLN as direct seller to End Consumer

1. POSO : Provide, Own, Self Operated
2. POPO : Provide, Own, Privately Operated
3. PPOO : Provide, Privately Owned and Operated
4. PLSO : Provide, Lease, Self Operated
5. PLPO : Provide, Lease, Privately Operated

*Tariff L = Rp. 1.644 x N (1,5) = max Rp. 2.466,-

**BUSINESS SCHEME 2:**
Business Entities Holding IUPTL Sales as Direct Sellers to End Consumers

1. ROSO : Retail, Own, Self Operated
2. ROPO : Retail, Own, Privately Operated
3. RPOO : Retail, Privately Owned and Operated
4. RLSO : Retail, Lease, Self Operated
5. RLPO : Retail, Lease, Privately Operated

PLN sells electricity at bulk rates (Q Factor =1,01) Rp. 714,- /kWh to the IUPTL Business Entity

**PKS** = Cooperation agreement
EVCS COOPERATION MODEL FOR BUSINESS SCHEME 1
Provide, Privately Owned and Operated (PPOO)

**PLN:**
1. Integrated IUPTL Holder
2. Power Supply
3. Charge.IN Platform Provider

**Partner:**
1. EV Charger
2. Land/Property
3. O & M

**Composition**

<table>
<thead>
<tr>
<th>Model</th>
<th>Integrated IUPTL</th>
<th>Electricity Provider</th>
<th>EVCS Platforms (Charge.IN)</th>
<th>EV Charger Equipment</th>
<th>Land</th>
<th>EVCS O &amp; M</th>
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<tr>
<td>Model 1</td>
<td>PLN</td>
<td>PLN</td>
<td>PLN</td>
<td>Partner</td>
<td>PLN</td>
<td>Partner</td>
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<tr>
<td>Model 2</td>
<td>PLN</td>
<td>PLN</td>
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<td>Partner</td>
<td>PLN</td>
<td>Partner</td>
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<tr>
<td>Model 3</td>
<td>PLN</td>
<td>PLN</td>
<td>PLN</td>
<td>Partner</td>
<td>Tidak ada biaya sewa</td>
<td>Partner</td>
</tr>
</tbody>
</table>
2021 EVCS DEVELOPMENT LOCATION PLAN

*Will be built by PLN total 67 units

**SUMATERA**
- Bandara: 1
- Stasiun: 10
- TOL: 6
- Lokasi Lain: 12

**JAWA, MADURA, BALI**
- Bandara: 6
- Stasiun: 10
- TOL: 6
- Lokasi Lain: 23

**SULAWESI, MALUKU, PAPUA, NUSA TENGGARA**
- Bandara: 6
- Stasiun: 10
- TOL: 6
- Lokasi Lain: 8

Information:
1. The location of the EVCS placement can be adjusted/re-determined by considering the operational aspects.
2. Type of EV Charger:
   a. EV Charger 25 kW: 32 units (Provided by PLN)
   b. EV Charger 50 kW: 35 units (Provided by PLN)
   c. Rest 101 units (Provided By Private Sector)
3. EVCS in Public Area:
   a. 7 Airports: Bali, Surabaya, Yogyakarta, Semarang, Malang, Medan, and Soekarno-Hatta
   b. 10 Train Stations in Jabodetabek
   c. TOL: Lampung, Semarang, Gresik, Probolinggo

- PLN invites the Private Sector to participate in building EVCS according to the existing business scheme.
- Total units to be built by the private sector using business scheme 1 especially the PPOO model and business scheme 2 are 101 units.
- For the type of EVCS to be built, it can be adjusted to the market potential and the needs of the private sector (for buses, taxis or other commercials).
VARIOUS TYPES OF EVCS TO BE BUILT IN 2021

EV Charger 25 kW (Fast Charging)

EV Charger 50 kW (Fast Charging)

EV Charger 150 kW (Ultra Fast Charging) *)

Heavy Vehicle Charger 150 – 450 kW (For Buses) *)

*) PLN is ready to cooperate with the private sector who wishes to build ultra fast charging or charging stations for buses
1. Electric vehicles are the answer to air pollution conditions caused by the transportation sector, especially in urban areas
2. PLN is ready to support the EV ecosystem which is expected to accelerate the era of electric vehicles starting from two-wheeled vehicles, 4-wheeled private vehicles and also public transportation (taxi and bus).
3. In order to accelerate the development of the EVCS infrastructure, PLN has made several business schemes for the development of EVCS and a stimulus for the private sector involved in the EVCS business.
4. This year, 168 EVCS units will be built, with details of 67 units to be built by PLN and 101 units to be handed over to the private sector with a choice of predefined business schemes.
5. PLN is ready to support and cooperate with the private sector who wish to build charging stations for buses
Thank You